

What is Claimed is:

1. A method for manufacturing a MRAM, comprising
the steps of:

5 forming a metal layer for a connection layer
connected to a semiconductor substrate through a lower
insulating layer;

10 sequentially forming a pinned magnetic layer, a
tunnel barrier layer and a free magnetic layer on the metal
layer;

forming a hard mask on the free magnetic layer;

etching the hard mask layer and the free magnetic
layer in a photolithography process using a MTJ cell mask to
expose the tunnel barrier layer;

15 sequentially forming a barrier layer and an
insulating film on the entire surface;

anisotropically etching the insulating film to form
an insulating film spacer on a sidewall of the hard mask
layer and the free magnetic layer; and

20 etching the tunnel barrier layer, the pinned magnetic
layer and the metal layer using the insulating film spacer
and the hard mask layer as a mask to form a MTJ cell and a
connection layer.

2. The method according to claim 1, wherein the barrier layer is a TiN layer, a TiON layer or a Ta layer.

3. The method according to claim 1, wherein the
5 insulating film is an oxide film or a nitride film.